LESSON MAKER PRO

Chance Check

Build probability models from data, then check their predictions.

GRADE 7 · 7A.DSP.C.30

7A.DSP.C.30 "Define and develop a probability model, including models that may or may not be uniform, where uniform models assign equal probability to all outcomes and non-uniform models involve events that are not equally likely. a..."

NAME _____ DATE _____

MODEL THE CHANCE

In a uniform model, every outcome has the same probability. To build a model from collected data, divide the number of times an event happened by the total number of trials. A model can help you predict future results, but actual results may differ because of chance.

WORKED EXAMPLE

A lunch poll records snack choices. Use the data to predict how many of the next 54 students will choose fruit.

SNACK CHOICES

Snack	Students
Fruit	13
Crackers	9
Popcorn	5

1. Total students: 13 + 9 + 5 = 27.
2. Estimated P(fruit) = 13/27.
3. Predicted fruit choices: 54 × 13/27 = 26.

Answer: 26 students

PRACTICE 6 problems

1 A bag has 3 green tokens and 7 yellow tokens. Each token is equally likely to be drawn. What is P(green)?

ANSWER _____

2 Use the data to find the estimated probability that the next pen chosen is black.

PENS CHOSEN

Color	Times chosen
Blue	6
Black	10
White	4

ANSWER _____

3 An app picks a whole number from 1 to 8, with each number equally likely. What is P(6)?

ANSWER _____

4 Use the music request data to predict how many of the next 48 requests will be for jazz.

MUSIC REQUESTS

Type	Requests
Pop	12
Rock	8
Jazz	4

ANSWER _____

5 A fair coin model predicts P(heads) = 1/2. A student flips the coin 20 times and gets 14 heads. How many heads did the model predict? How many more heads were observed than predicted?

ANSWER _____

6 A random number generator picks 1, 2, or 3 with equal probability. In 30 trials, it picks 1 a total of 18 times. Is the model uniform? What is the observed probability of 1?

ANSWER _____

APPLY IT Show your work

1 Players record the rewards they receive in a game. Use their results to predict how many common rewards they would get in the next 60 rewards. Is the model based on their data uniform?

GAME REWARDS

Reward	Times received
Common	24
Rare	16
Ultra rare	8

ANSWER _____

2 A game uses a model that gives a bonus song a 1/4 chance of playing. In 80 plays, the bonus song plays 28 times. How many bonus songs did the model predict? How many more were observed? Give one possible reason for the difference.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A playlist model says P(dance track) = 1/4. Use the results in the table. Which group's observed probability is closer to the model? Show both observed probabilities and give one possible reason neither exactly matches.

PLAYLIST TESTS

Group	Dance tracks	Total plays
A	18	40
B	21	60

WORK SPACE AND ANSWER

ANSWER KEY # Chance Check

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A bag has 3 green tokens and 7 yellow tokens. Each token is equally likely to be drawn. What is P(green)?	**3/10**
2	Use the data to find the estimated probability that the next pen chosen is black.	**1/2**
3	An app picks a whole number from 1 to 8, with each number equally likely. What is P(6)?	**1/8**
4	Use the music request data to predict how many of the next 48 requests will be for jazz.	**8 requests**
5	A fair coin model predicts P(heads) = 1/2. A student flips the coin 20 times and gets 14 heads. How many heads did the model predict? How many more heads were observed than predicted?	**10 heads predicted; 4 more heads observed.**
6	A random number generator picks 1, 2, or 3 with equal probability. In 30 trials, it picks 1 a total of 18 times. Is the model uniform? What is the observed probability of 1?	**Yes, the model is uniform; the observed probability is 18/30 = 3/5.**

PART 2 · APPLY IT

1. **30 common rewards; the data-based model is not uniform.** There were 48 rewards, so the estimated probability of a common reward is 24/48 = 1/2, and 60 × 1/2 = 30. The three rewards have different estimated probabilities.
2. **20 predicted; 8 more observed. Chance variation is one possible reason.** The model predicts 80 × 1/4 = 20 bonus songs. The observed count is 28 − 20 = 8 higher; results can vary by chance.

CHALLENGE

Group A: 18/40 = 9/20. Group B: 21/60 = 7/20. Since 1/4 = 5/20, Group B is closer. Chance variation could explain why neither observed probability exactly matches the model.

Accept equivalent fractions. For discrepancy explanations, also accept that the game or playlist may not follow its stated model, if the student explains the possibility.